

Name:	Date:
Topic:	Class:

Main Ideas/Questions	Notes/Examples	
Writing Linear Equations Given a POINT & SLOPE	To write a linear equation given the slope of the line (m), and a point that it passes through (x_1, y_1) , use the point-slope formula : _____	
Examples	1. $(-1, 7); m = -4$	2. $(-6, -5); m = \frac{2}{3}$
Writing Linear Equations Given TWO POINTS	To write a linear equation given two points (x_1, y_1) and (x_2, y_2) use the slope formula followed by the point-slope formula : _____  _____	
Examples	3. $(-6, 1)$ and $(-3, 7)$	4. $(-2, -2)$ and $(-6, 8)$
	5. $(10, -5)$ and $(1, -8)$	6. $(-8, -3)$ and $(-2, -3)$

LINEAR EQUATION APPLICATIONS: Slope-Intercept Form

7. A cab ride costs \$4 plus \$1.75 per mile driven.

a) Write an equation to represent the cab fare.
Define your variables.

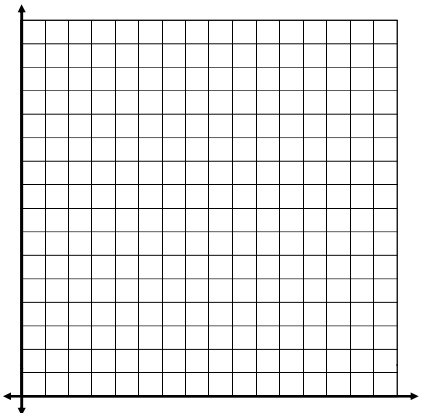
b) If Clay's destination is 17 miles away and he has \$30, will he make it?

8. The Jones' are purchasing a new home. The closing costs are \$249 plus 3% of the purchase price of the home.	
a) Write an equation to represent the total closing costs. Define your variables.	b) The purchase price of their home is \$195,000. The sellers offered \$5,000 in closing cost assistance. Will this cover all their closing costs? If not, how much will the Jones' need to pay out of pocket?
9. A 22.5-ounce candle burns at the rate of one ounce every five hours.	
a) Write an equation to represent the amount of candle left. Define your variables.	b) How many hours will the candle last?
LINEAR EQUATION APPLICATIONS: Standard Form	
10. Josh bought 3 bags of potting soil and 10 bags of mulch from Home Depot.	
a) Write an equation to represent the total cost. Define your variables.	b) If Josh spent \$40.91 and mulch cost \$2.75 per bag, how much was a bag of potting soil?
11. Kayleigh has a collection of quarters and nickels.	
a) Write an equation to represent the total value of the coins. Define your variables.	b) If the total value of the coins is \$5.50 and Kayleigh has 17 quarters, how many nickels does she have?
12. The baseball concession stand sells soft pretzels for \$4.50 and bags of popcorn for \$3.25.	
a) Write an equation to represent the total sales from pretzels and popcorn on a given day. Define your variables.	b) If the concession stand sold 137 soft pretzels, how many bags of popcorn would they need to sell to make at least \$1,000?

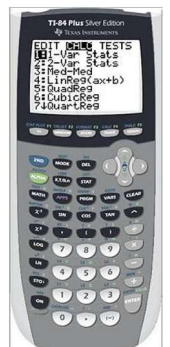
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SCATTER PLOTS	A scatter plot shows the relationship between two variables . Sketch the three possible relationships below.		
	Positive Correlation	Negative Correlation	No Correlation

LINE OF BEST FIT	Given a positive or negative correlation, it's possible to write a prediction equation, called a line of best fit . It can be used to predict the value of a variable given the value of the other variable.
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Example <table border="1"> <thead> <tr> <th>d</th><th>t</th></tr> </thead> <tbody> <tr><td>0</td><td>85</td></tr> <tr><td>4</td><td>82</td></tr> <tr><td>7</td><td>81</td></tr> <tr><td>10</td><td>79</td></tr> <tr><td>12</td><td>77</td></tr> <tr><td>15</td><td>76</td></tr> </tbody> </table>	d	t	0	85	4	82	7	81	10	79	12	77	15	76	The table to the left shows the relationship between the depth, d, of the lake in feet and the water temperature, t, in degrees Fahrenheit. a) Make a scatter plot.  b) Use two ordered pairs to write a line of best fit. c) Predict the temperature of the lake at 25 feet.
d	t														
0	85														
4	82														
7	81														
10	79														
12	77														
15	76														

LINEAR REGRESSION	Another method to find the line of best fit is called linear regression . This can be done through your graphing calculator and will create the most precise equation possible.	
Calculator Steps	Enter your data.	Find the line of best fit.
	- Hit STAT, ENTER - Enter x-values in L₁ - Enter y-values in L₂	- Hit STAT - Arrow over to CALC - Choose #4-LinReg(ax+b) - Hit ENTER (possibly twice)



Linear Regression Examples

1. The table below shows the number of people, p , and suitcases, s , on 8 airplanes

p	63	115	153	192	224	297	331	375
s	112	209	278	302	379	500	586	712

a) Find the regression equation.

b) Predict the number of suitcases on an airplane with 500 people.

2. The table below shows the population, in thousands, during certain years since 2000.

<i>year</i>	0	3	6	9	12	15
<i>population</i>	10.7	11.1	11.9	12.5	13.2	13.6

a) Find the regression equation.

b) Predict the population in 2025.

3. The table below shows the salary, in millions, made by the highest paid major league baseball player during certain years.

<i>year</i>	1985	1991	1993	1996	1998	2001
<i>salary</i>	2.1	3.8	6.2	9.3	14.9	22

a) Find the regression equation.

b) Predict the salary of the highest paid player in 2020.

4. The table below shows the mileage, m , on six cars that were recently traded in, along with their value, v .

m	5,824	25,824	58,126	73,005	105,092	159,062
v	\$16,920	\$10,300	\$7,225	\$5,300	\$3,125	\$1,800

a) Find the regression equation.

b) Predict the value of a car with 13,258 miles.